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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,745	07/28/2003	Makoto Nakamura	023484-0151	3816

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FOLEY AND LARDNER
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WASHINGTON, DC 20007

EXAMINER

CORRIGAN, JAIME W

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/627,745

Applicant(s)

NAKAMURA ET AL.

Examiner

Jaime W Corrigan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 11 and 13 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1-5-05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the request for reconsideration filed on 04 February 2005. Claims 2-3, 12, 14 have been amended. Overall, claims 1-10, 12, 14 are pending in this application. The arguments with respect to the references applied in the first Office Action were deemed persuasive, however, a new Non-final rejection is set forth below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-2, 4-10, 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Grau (PN 6,615,777).

Regarding claim 1 Grau discloses a variable-valve-actuation (VVA) apparatus (See Figure 1 (3)) for an internal combustion engine (See Abstract) with a valve, comprising: a control shaft (See Figure 1 (1)) arranged rotatable in accordance with operating conditions of the engine; an alteration mechanism (See Figure 1 (4)) which changes at least an operating angle (See Abstract, Column 3 Lines 22-45, Column 4 Lines 7-24) of the valve in accordance with rotation of the control shaft; and a drive mechanism (See Figure 1 (7)) which rotates the control shaft, the drive mechanism

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comprising an electric motor (See Figure 1 (7)) and a reduction mechanism (See Figure 1 (5), (8)), the reduction mechanism having a reduction ratio set to be larger when the valve is under control of small operating angle than when the valve is under control of large operating angle (See Figure 1 (1), (2), (5), (8)).

Regarding claim 2 Grau discloses an output shaft (See Figure 1 (12)) linked to the motor and having at an outer periphery an engagement (See Figure 1 (9)); a moving member (See Figure 1 (8)) meshed with the engagement of the output shaft, the moving member moving in an axial direction (Column 4 Lines 7-24) of the output shaft in accordance with rotation of the output shaft; a link member (See Figure 1 (5)) having a first end (See Figure 1 (11)) swingably linked to the moving member; and a linkage (See Figure 1 (4)) swingably linked to a second end (See Figure 1 near (10)) of the link member, the linkage rotating the control shaft by torque transmitted from the link member in accordance with axial movement of the moving member (See Abstract, Column 3 Lines 22-45, Column 4 Lines 7-24), wherein when the valve is under control of small operating angle, an angle formed between the link member and the output shaft is increased (See Figure 1 (1), (2), (5), (8)).

Regarding claim 4 Grau discloses the output shaft (See Figure 1 (12)) of the reduction mechanism (See Figure 1 (5), (8)) comprises a threaded shaft having an external (See Figure 1 (9)) thread formed on an outer peripheral surface, and the moving member comprises a threaded nut (See Figure 1 (8)) having an internal thread

formed on an inner peripheral surface, wherein the external thread is meshed with the internal thread.

Regarding claim 5 Grau discloses the output shaft of the reduction mechanism comprises a threaded shaft (See Figure 1 (9)) having a spiral ball groove formed in an outer peripheral surface, and the moving member comprises a threaded nut (See Figure 1 (8)) having a guide ball groove formed in an inner peripheral surface, wherein the ball groove cooperates with the guide ball groove to hold a plurality of balls in a free-roll manner.

Regarding claim 6 Grau discloses the linkage (See Figure 1 (4)) of the reduction mechanism is fixed to the control shaft (See Figure 1 (1)), wherein a pivotal point of the linkage with the link member is offset (See Figure 2 (4), (5)) with respect to an axis of the control shaft.

Regarding claim 7 Grau discloses when the valve is under control of maximum operating angle, the angle formed between the link member and the output shaft is minimum (See Figure 1 (5), (12)).

Regarding claim 8 Grau discloses when the valve is under control of minimum operating angle, the angle formed between the link member and the output shaft is maximum (See Figure 1 (5), (12)).

Regarding claim 9 Grau discloses a restriction mechanism which restricts maximum axial movement of the moving member (See Figure 1 (13)).

Regarding claim 10 Grau discloses the moving member (See Figure 1 (8)) is moved axially without being rotated (See Abstract, Column 3 Lines 22-45, Column 4 Lines 7-24).

Regarding claim 12 Grau discloses a control shaft (See Figure 1 (1)) arranged rotatable in accordance with operating conditions of the engine (See Abstract); an alteration mechanism (See Figure 1 (4)) which changes at least an operating angle of the valve in accordance with rotation of the control shaft (See Abstract, Column 3 Lines 22-45, Column 4 Lines 7-24); and a drive mechanism (See Figure 1 (7)) which rotates the control shaft, the drive mechanism comprising an electric motor (See Figure 1 (7)) and a reduction mechanism (See Figure 1 (5), (8)), the reduction mechanism having a reduction ratio set to be larger (See Figure 1 (1), (2), (5), (8)) when the valve is under control of small operating angle than when the valve is under control of large operating angle, the reduction mechanism comprising: an output shaft (See Figure 1 (12)) linked to the motor and having at an outer periphery an engagement (See Figure 1 (9)); a moving member (See Figure 1 (8)) meshed with the engagement of the output shaft, the moving member moving in an axial direction (Column 4 Lines 7-24) of the output shaft in accordance with rotation of the output shaft; a link member (See Figure 1 (5)) having a first end (See Figure 1 near (11)) swingably linked to the moving member; and a

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linkage (See Figure 1 (4)) swingably linked to a second end of the link member, the linkage rotating the control shaft by torque transmitted from the link member in accordance with axial movement of the moving member (See Abstract, Column 3 Lines 22-45, Column 4 Lines 7-24), wherein when the valve is under control of small operating angle, an angle formed between the link member and the output shaft is increased (See Figure 1 (1), (2), (5), (8)).

Regarding claim 14 Grau discloses a control shaft (See Figure 1 (1)) arranged rotatable in accordance with operating conditions of the engine (See Abstract); means (See Figure 1 (8), (5), (1), (2), (4)) for changing at least an operating angle of the valve in accordance with rotation (See Abstract, Column 3 Lines 22-45, Column 4 Lines 7-24) of the control shaft; and means for rotating the control shaft, the rotating means comprising means (See Figure 1 (7), (12), (5), (8)) for providing torque and means for reducing (See Column 2 Lines 64-67, Column 3 Lines 1-3) the torque, the reducing means having a reduction ratio set to be larger (See Figure 1 (1), (2), (5), (8)) when the valve is under control of small operating angle than when the valve is under control of large operating angle.

Allowable Subject Matter

Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Murata et al. (PN 5,778,840), Regueiro (PN 6,167,854) disclose similar variable valve devices.

Any inquiry concerning this communication from the Examiner should be directed to Examiner Jaime Corrigan whose Carlyle telephone number is (571) 272-4858. The Examiner can normally be reached on Monday – Friday from 8:30 a.m. – 6:00 p.m. 2nd Friday off.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number for this group is (703) 872-9306.

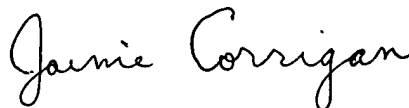
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-3700.

JC

Jaime Corrigan

A handwritten signature in cursive script that reads "Jaime Corrigan".

Patent Examiner

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April 22, 2005

A handwritten signature in cursive script that reads "Thomas Denion".

THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700